AFRTS

Parts No. OS3-042

OTARI®

MX-5050MKIII-2
PROFESSIONAL RECORDER
OPERATION MANUAL

Richard L. Hess

Audio Tape Restoration

1–877–TAPE–FIX
(Toll Free U.S. & Canada)

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CAUTION

To prevent fire or shock hazard :

Do not expose this appliance to rain or moisture.

Do not remove cover.

No user-serviceable parts inside.

Refer servicing to qualified service personnel.

PLEASE READ THROUGH SAFETY INSTRUCTIONS

ON THE NEXT PAGE.

SAFETY INSTRUCTIONS

1. Read Instructions — All the safety and operating instructions should be read before the appliance is operated.

2. Retain Instructions — The safety and operating instructions should be retained for future reference.

3. Heed Warnings — All warnings on the appliance and in the operating instructions should be adhered to.

4. Follow Instructions — All instructions should be followed.

5. Water and Moisture — The appliance should not be used near water - for example, near a bathtub, washbasin, kitchen sink, laundrytub, in a wet basement, or near a swimming pool, etc.

6. Carts and Stands — The appliance should be used only with a cart or stand that is recommended by the manufacturer.

7. Ventilation — The appliance should be situated so that its location or position does not interfere with its proper ventilation.
   For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation operatings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

8. Heat — The appliance should be situated away from near sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.

9. Power Sources — The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

10. Grounding or Polarization — Precautions should be taken so that the grounding or polarization means of an appliance are not defeated.

11. Power-Cord Protection — Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs. Convenience receptacles, and the point where they exit from the appliance.

12. Cleaning — The appliance should be cleaned only as recommended by the manufacturer.

13. Nonuse Periods — The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

14. Object and Liquid Entry — Care should be taken so that

WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to ratio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at this own expense will be required to take whatever measures may be required to correct the interference.

COMMUNICATION WITH OTARI
FOR SERVICE INFORMATION AND PARTS

The OTARI PRODUCTS are manufactured under strict quality control and each unit is carefully tested and inspected prior to shipment from our factory.

If, however, some adjustments or technical support become necessary, replacement parts are required, or technical questions arise, please contact your nearest Otari dealer or write to:

OTARI ELECTRIC CO., LTD.

4-29-18, Minami Ogikubo,
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Phone: (03) 333-9631
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OTARI CORPORATION

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OTARI SINGAPORE PTE., LTD.

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OTARI ELECTRIC (UK) LTD.

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Telex: 849453 OTARI G
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Another part of Otari's continuous technical support program for our products, is the continuous revision of manuals as the equipment is improved or modified.

In order for you to receive our information and service applicable to your requirements, and for the technical support to function properly, please include the following information, most of which can be obtained from the name plate on the equipment in all correspondences.

1. Model Number
2. Serial Number
3. Date of purchase
4. Name and address of dealer from whom machine was purchased
5. Power requirements (voltage and frequency) of the machine
6. Manual number to which you are referring

TABLE OF CONTENTS

SECTION I. GENERAL INFORMATION

The MX-5050 MK III-2 Recorder is a professional quality two-speed audio tape recorder/reproducer, designed for optimum performance and long life. It accommodates a 1/4 inch tape, 7-1/2 ips (19.05 cm/sec) and 15 ips (38.1 cm/sec) tape speeds.

1.1 SYSTEM DESCRIPTION

Among the many professional features of the MX5050MKIII-2 are: selective reproduction, motion sensing, an edit control that permits spilling, an adjustable cueing control for audible monitoring in the fast-forward and rewind modes, a built-in two frequency low distortion test and cue-tone oscillator, a computerized elapsed time indicator with a digital LED display, front adjustable record bias, equalization, and level controls, active balanced input and output circuits, a reference flux level indicator on the front amplifier panel, a standard reference level output switch, separate line and microphone input level controls for each channel, switches for recording levels, equalization, microphone, and output level attenuators, play-back equalization pots for each speed, a memory stop button for automatically searching the zero tape time location with F. FWD or RWD mode, ceramic tape guides, big head housing, lower transport noise, and improved specifications for distortion, erase effect, and signal and noise ratio.

1.1.1 TAPE TRANSPORT

All components of the tape transport system are mounted on a rigid aluminum frame for stability. The transport design incorporates two 6-pole induction motors for the reels and a 3-speed DC servo motor (Direct drive) for the capstan.

Speed selection is made by a front panel push-button switch which also switches the equalizer.

The transport accommodates tape reels of 10-1/2 inches, 7 inches, and 5 inches in diameter with NAB or EIA hub configurations. A solenoid-actuated tape lifter lifts the tape away from the heads in the fast forward and rewind modes, in addition to the stop mode, to increase head and tape life.

In addition to the editing controls, a tape-splicing block (Fig. 3-3) mounted on the head cover holds the tape for ease of editing.

Momentary contact push-button switches on the transport are used to select operational modes: record, play, stop, rewind, and fast forward. These modes may be controlled from a remote location by means of an optional remote control unit (page 1-5).

1.1.2 RECORD/REPRODUCE ELECTRONICS

FEATURES

(1) The RECORD/REPRODUCE amplifier unit is connected to the transport unit only by the connectors and therefore can be easily removed for ease in servicing.

(2) This machine contains a SEL. REP. function for overdubbing: for example, SOUND WITH SOUND, SOUND ON SOUND, carried out by the PUNCH-IN and PUNCH-OUT functions of the transport control.

(3) This machine provides both NAB and IEC equalizers, switchable on the rear panel. However, when the equalizer position is changed, fine tuning the record and reproduce equalizer adjustment controller is necessary.

(4) In order to give optimum performance for different types of recording tapes, record bias, level, and equalization controls on the front panel can be adjusted to meet any requirements.

(5) To improve the signal to noise ratio and increase the head room, the record/reproduce electronics have been designed with a high-fidelity amplifier.

1.1.3 HEAD ASSEMBLIES

As viewed from the front of the recorder, the configuration of the head assembly of model MX-5050 MKIII-2 is shown in Table 1-1.

Table 1-1 Head Assembly Configuration

Head Structure				Record Head
H1 Erase	H2 Playback	H3 Record	H4 Playback	
2T, 2CH	4T, 2CH	2T, 2CH	2T, 2CH	2T, 2CH Stereo

OPTIONAL ACCESSORIES

1.	Remote Control Unit	CB-102
2.	Auto Locator	ZA-54C (CB-116)
3.	Cleaning Kit	ZA-51B
4.	Balanced Input Transformer Ass'y	ZA-53T
5.	Balanced Output Transformer Ass'y	ZA-53S
6.	Hold Down Knob (for EIA hub)	ZA-52Y

1.4 SERVICE AND REPLACEMENT PARTS

For service and replacement parts, or for technical support, please contact your nearest service center, OTARI dealer, or write directly to OTARI. (See page iii for complete addresses.)

1.5 SPECIFICATIONS

The specifications of the MX-5050 MKIII-2 are as listed in Table 1-2.

NOTE: Specifications are based on tape speeds of 7-1/2 and 15 ips. Specifications, although obtainable when serviced by qualified service personnel, are not guaranteed when using lower tape speeds.

Table 1-2 Specifications of the MX-5050 MKIII-2

Tape Width and Tracks	1/4 inch (6.3 mm) tape: 2 tracks (0.079 in. or 2.0 mm track width)
Tape Speeds	7-1/2 and 15 ips (19 and 38 cm/sec) or 3-3/4 and 7-1/2 ips (9.5 and 19 cm/sec) Maximum deviation: ± 0.2 % measured with 1.5 mil (0.038 mm) tape.
Reel Sizes	7 inch or 10-1/2 inch plastic or metal, EIA or NAB.
Heads	Half-track configuration. Four head stacks: 2T erase, 4T reproduce, 2T record, 2T reproduce.

Outputs: Line	Level: +4 dBm or -10 dBm, rear panel switch selectable. Active balanced (Floating type), Source impedance: 5 ohms. Load impedance: More than 600 ohms. Maximum line output: +27 dBm with a 600 ohm load.
Headphone	Level: -24 dBm with an 8 ohm load. Load impedance: 8 ohms or greater.
Equalization	NAB or IEC for 3-3/4, 7-1/2, and 15 ips. Switchable on the rear panel, but calibration is necessary.
Frequency Response	15 ips : 30 Hz to 20 kHz ± 2 dB 7-1/2 ips: 20 Hz to 18 kHz ± 2 dB 3-3/4 ips: 20 Hz to 10 kHz ± 2 dB Specifications refer to a 1 kHz reference when recorded on 3M 226.
Signal to Noise Ratio	Over-all measured at the level of 520 nWb/m. NAB Equalization:

Tape Speed	Weighted	Unweighted
15 ips	66 dB	64 dB
7-1/2 ips	68 dB	68 dB
3-3/4 ips	66 dB	64 dB

IEC Equalization:

Tape Speed	Weighted	Unweighted
15 ips	67 dB	65 dB
7-1/2 ips	66 dB	64 dB
3-3/4 ips	66 dB	64 dB

NOTES: 1. Signal to noise ratio is measured with respect to a recorded level of 520 nWb/m to biased tape noise when using Scotch 226 magnetic tape.
Unweighted: Using a 30 to 18 kHz RC filter to attenuate noise outside the audio spectrum.
Weighted : Using an NAB or ASA "A" weighting filter and a 1 kHz reference.

2. Otari reserves the right to change specifications without notice and/or obligation.

SECTION II. INSTALLATION

This section of the manual provides information on unpacking and inspection, location and environment, and power and signal connections.

2.1 UNPACKING AND INSPECTION

The MX-5050 MKIII-2 system is shipped from the factory in a single cardboard packing case. Upon receipt, examine the case for any signs of damage. Unpack the equipment and inspect for any signs of damage. Use great care when unpacking the equipment and removing packing materials to prevent damage to critical components such as the capstan, head assembly, and tension arms.

Referring to the lists in Secs. 1.2 and 1.3 (as applicable), verify that all items have been received. Report any shortage or damage to the carrier and your local Otari dealer. Save the packing case for possible reshipment. Other packaging may cause damage during transportation and will void the warranty.

Please refer to the illustration which is attached to flap of the packing box regarding the repacking method.

2.2 CABLE CONNECTION

Before installing the machine on the place you desire, you should connect the each cable to the proper connector on the amplifier unit as described below. (One end of each cable is already linked to the connector on the transport rear panel.)

Table 2-1 Cable Connection

	Transport Unit	Amplifier Unit
1	TO AMP connector	TO DECK connector
2	RECORD/ERASE HEAD connector	RECORD/ERASE HEAD connector
3	REPRODUCE HEAD connector	REPRODUCE HEAD connector

2.3 LOCATION AND ENVIRONMENT

The area chosen for operation should be adequately ventilated and dust free. Since recording is by an electromagnetic process, it is possible that strong electromagnetic fields may affect the system adversely. Common sources of interference are fluctuating loads on nearby high-voltage lines, heavy duty transformers, and transmitting equipment.

2.5 STANDARD SWITCH POSITION ON SHIPMENT

Either the NAB standard or the IEC standard of equalization, recording level, etc. may be used with the Otari MX-5050 MKIII-2. These units have been provided with a slide switch on the back panel which selects one of these two standards; to change standards, merely slide the switch to the desired position.

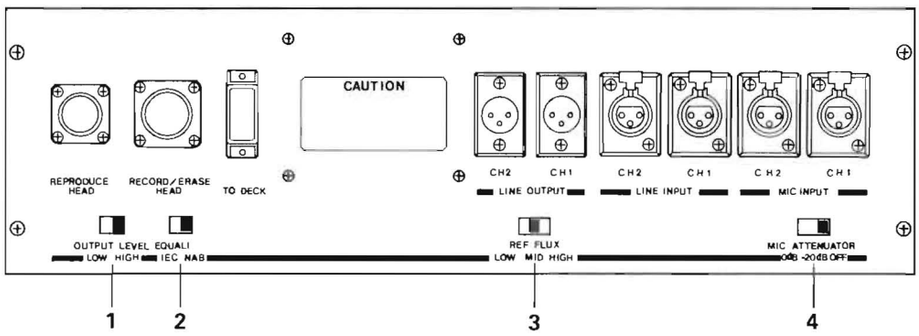


Fig. 2-2(a) Standard Switch Position on Shipment (NAB)

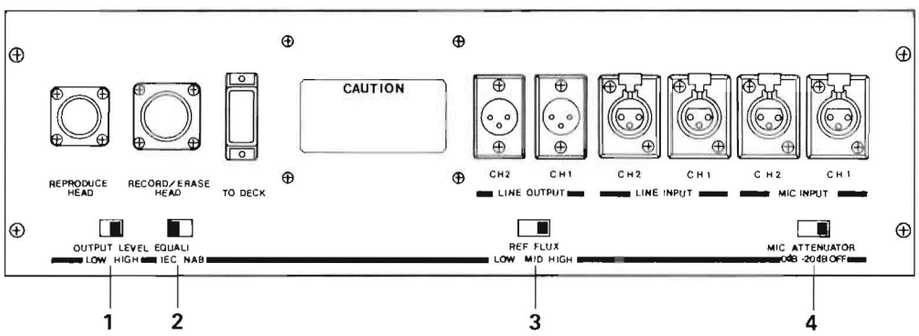


Fig. 2-2(b) Standard Switch Position on Shipment (IEC)

Table 2-2 Standard Switch Position on Shipment

Switch	Ref. No.	Type	
		NAB	IEC
OUTPUT LEVEL	1	HIGH	HIGH
EQUALIZER	2	NAB	IEC
RECORD LEVEL	3	M	H
MIC. ATT	4	OFF	OFF

Index No.	Name	Function
1	REMOTE CONTROL Connector	Remote control connector for use with the optional remote control unit to control the record, play, stop, rewind, and fast forward modes.
2	LINE OUTPUT Connector	Male XLR-type connector. Active balanced output (Floating type). Source impedance: 5 ohms Load impedance: 600 ohms or greater. Level: +4 dBm or -10 dBm at 0 VU switchable by the OUTPUT LEVEL switch.
3	LINE INPUT Connector	Female XLR-type connector. Active balanced input (Foating type). Input impedance: 10 k ohms Minimum input: -15 dBm Maximum input before clipping: +30 dBm Optional transformer balanced input. Input impedance: 10 k ohms Minimum input: -15 dBm Maximum input before clipping: +30 dBm
4	MICrophone INPUT Connector	Female XLR-type connector. Active balanced input (Floating type). Applicable microphone impedance: 150 - 10 k ohms Minimum input: -70 dBm or -50 dBm switchable by means of the MIC ATTENUATOR switch.
5	GROUND Terminal	Auxiliary ground connection for use with equipment not connected to a common AC ground.
6	AC POWER Connector	Three-contacts socket for connection to AC power and ground.

		For more detail information of external sync. operation. Please contact to OTARI dealer.
13	MICrophone ATTENUATOR Switch	Used to adjust the sensitivity of the microphone amplifier in accordance with the microphone's input level.

ATT	Minimum Input (Sensitivity)
0 dB	-70 dBm
-20dB	-50 dBm
OFF	Shorted to the ground

14	REF FLUX Selector Switch	This switch is used for setting the recording level: "High", "Medium", and "Low". Located on the Amplifier front panel are 3 LED Ref Flux Selector Indicator displays which indicate the position of the switch. (185/250/320)

Position	Flux	Relative Level	Test Tape	Recording Tape to be used
Low	185 nWb/m*	0 dB	Ampex Operating Level	Scotch 177 Ampex 641
Medium	250 nWb/m*	+2.6 dB	MRL NAB Reference Flux	Scotch 206, 207, 226, 250 Ampex 406, 407, 456
High	320 nWb/m**	+3.8 dB	BASF or MRL IEC Standard	IEC Equalization

* Short circuit flux

** Open circuit flux

15	EQUALIZER Selector Switch	The two-position EQUALIZER selector switch is used to select either LEC or NAB equalization.

(2) Connect the cable shield to pin 1.

For unbalanced inputs using two-conductor shielded cable, wire the male XLR-connector as follows:

(1) Connect the signal leads of a cable to pin 3 (high) and pin 2 (low) of the connector.
(2) Connect the cable shield to pin 1 of the connector.
(3) Connect a jumper from pin 1 to pin 2 of the connector.

For unbalanced inputs using single-conductor shielded cable, wire the male XLR-connector as follows:

(1) Connect the center conductor of the single-conductor shielded cable to pin 3 of the connector.
(2) Connect the cable shield to pins 1 and 2.

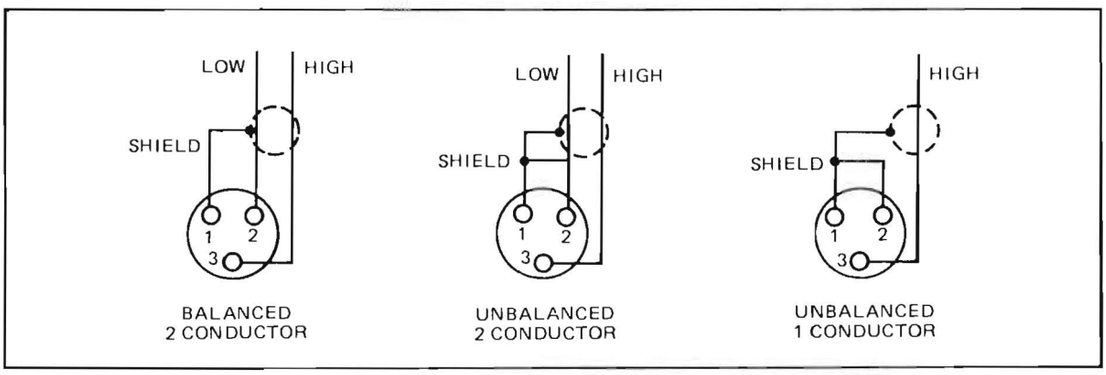


Fig. 2-3 Input/Output Assembly Connector Wiring

LINE OUTPUT CONNECTOR WIRING:

For balanced outputs, wire the female XLR-connector as follows:

(1) Connect the signal leads of a two-conductor shielded cable to pin 3 (high) and pin 2 (low) of the connector.
(2) Connect the cable shield to pin 1.

For unbalanced outputs using two-conductor shielded cable, wire the female XLR-connector as follows:

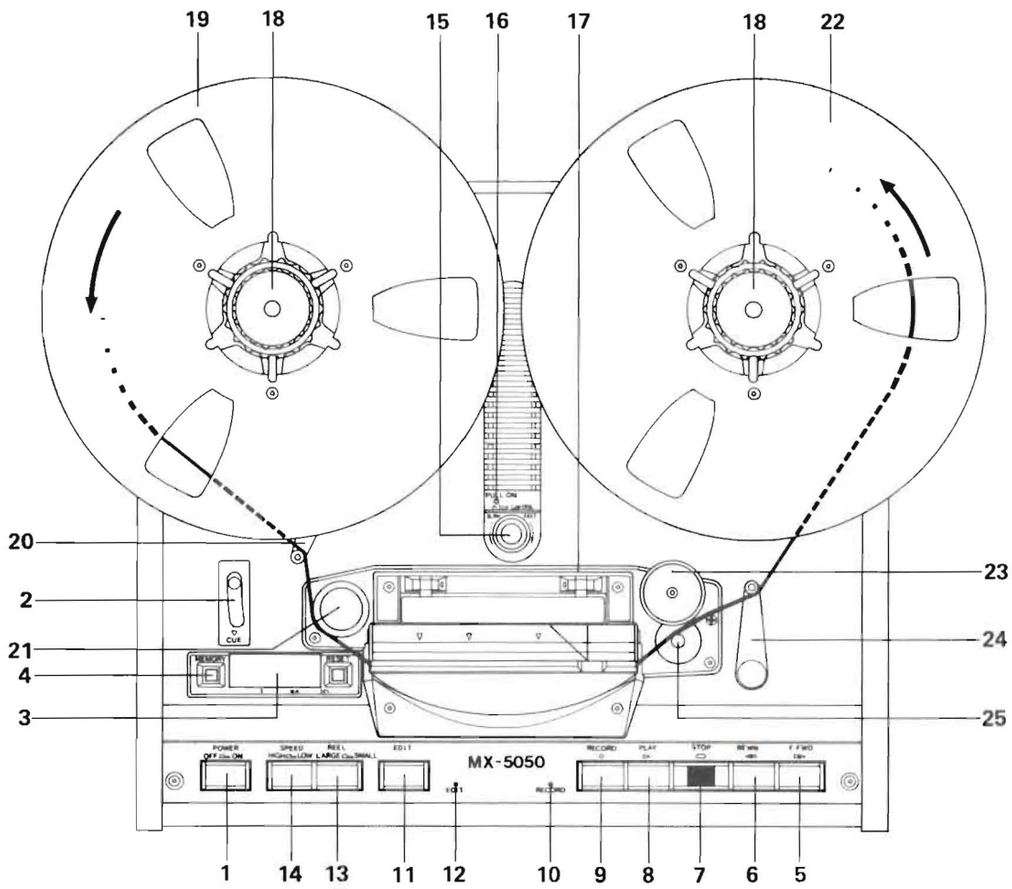
(1) Connect the signal leads of the cable to pin 3 (high) and pin 2 (low) of the connector.

SECTION III. OPERATION

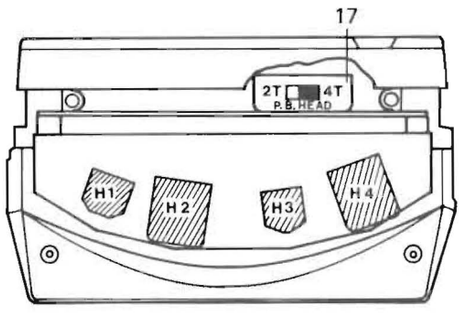
This section of the manual provides a description of all operating controls and indicators and their use in the system, and step-by-step procedures for the various modes of operation.

3.1 CONTROLS AND INDICATORS

Table 3-1 Tape Transport Controls and Indicators



Located inside the head cover is a switch for selection of either of the two playback head stacks. Flip the head cover "up" for easy access.



8	(Continued)	Pressing the PLAY pushbutton during the fast forward or rewind modes stops the tape, then automatically starts the play mode.
9	RECORD Pushbutton Switch	Used in conjunction with the PLAY pushbutton switch and the RECORD channel selector. With the desired channel pushbutton switches depressed, simultaneously pressing the PLAY and RECORD pushbuttons initiates the record mode and the red indicator illuminates. In the play mode, when the RECORD pushbutton is pushed, the unit enters the record mode. (This is called "Punch in".) In the record mode, when the PLAY pushbutton is pushed, the unit enters the reproduce mode. (This is called "Punch out".) Punch in and Punch out are used for overdubbing in conjunction with the sel. rep. function.
10	Record Indicator (red)	Used to indicate the record mode.

Transport record indicator	Amplifier record indicator	Transport	Recording
dark	dark	non rec. mode	x
blinks	illuminated	non rec. mode	x (ready)
remains illuminated	dark	rec. mode	x
	illuminated	rec. mode	o

Blinking means that the amplifier is in the record-ready mode. Recording is being carried out when the record indicators of both the amplifier and the transport remain illuminated.

11	EDIT Pushbutton Switch	Used to initiate the edit mode to aid in cutting out unwanted tape.

17	Reproduce Head Selector Switch	Used to select the appropriate reproduce head stack to conform to the type of tape to be reproduced.
18	NAB Hub Reel Hold Down Knobs	Used to attach EIA or NAB hub reels to the reel table. (Refer to Sec. 3.2.1.)
19	Supply Reel	Used to supply tape for reproduction or recording.
20	Tension Arm	Used to eliminate tape tension fluctuations.
21	TACHO Pulse Generator Roller	Used to generate the pulses for the elapsed time indicator.
22	Takeup Reel	Used to take up tape.
23	Pinch Roller	Used to correctly transmit the rotation of the capstan to the tape.
24	Tension Arm with Safety Switch	Used to eliminate tape tension fluctuations. When tape is exhausted, supply and takeup reel rotation is automatically stopped by the safety switch attached to the tension arm.
25	Capstan Shaft	The shaft used to keep speed constant while in the reproduce and record modes.

Table 3-2 shows the location and function of each control and indicator on the record/reproduce electronics control panel.

4	OUTPUT Level Controls	Used to control the playback level of the corresponding channel. (Control is deactivated when the SRL switch is in the "SRL" position.)
5	SRL Switch and Indicator (red)	In the "SRL (Standard Reference Level)" position, the red indicator is illuminated. The playback level is then determined by an internal preset potentiometer. The SRL can be selected by the Record level switch on the rear panel as follows:

RECORD LEVEL	Standard Reference Level	
	Flux Level	Based on
L	185 nWb/m	Ampex Operating level
M	250 nWb/m	MRL reference fluxivity of 250 nWb
H	320 nWb/m	BASF or MRL IEC reference level

In the normal position, the reproduce level is controlled by the OUTPUT controls of the corresponding channel.

DO NOT TURN THIS SWITCH OFF UNLESS YOU TURN THE LINE OUTPUT LEVEL CONTROLS (INDEX NO. 4 IN THIS TABLE) DOWN TO THE MINIMUM LEVEL WHILE A SIGNAL IS BEING OUTPUT TO OTHER EQUIPMENT, TO PREVENT POSSIBLE DAMAGE.

6	RECORD Selector Switch and Indicator (red)	Used to select channels for recording, and used in conjunction with the PLAY and RECORD pushbutton switches (Index Nos. 8 and 9 of Table 3-1). In the "out" position this switch prevents activation of the channel record mode.

13	MONITOR SOURCE/ TAPE Switch	In the "out" (SOURCE) position, the input signal is fed to the LINE OUT connectors, the PHONES jack, the VU meters, and the peak indicators. In the "in" (Tape) position, the signal being reproduced is fed to the LINE OUT connectors, the PHONES jack, VU meters, and the peak indicators.
14	EQ Selection Indicator	Located on the amplifier front panel are 2 LED EQ Selection Indicator Displays which indicate the position of the NAB or IEC EQ switch which is located on the back of the unit.
15	Record Level Selection Indicator	Located on the front amplifier front panel are 3 LED Record Level Selector Indicator Displays which indicate the position of the Record Level Selector switch which is located on the back of the unit.

3.2 OPERATING INFORMATION

3.2.1 USE OF THE REEL HOLD DOWN KNOBS

NAB hub reel hold down knobs are used as follows:

When an EIA hub (2-1/4 inch diameter hub) is used;
(1) Remove the NAB reel hold down knob by turning the inner knob counterclockwise.
(2) Place the reel on the reel table.
(3) Place the reel hold down knob on the reel and fix it by turning the inner knob clockwise.

NOTE: ZA-52Y optional accessory (see page 1-4) is recommendable to hold 2-1/4 inch diameter hub.

When an NAB hub (4-1/2 inch diameter hub) reel is used;
(1) Place the reel hold down knob on the reel table and lock it by turning the inner knob clockwise.
(2) Place the NAB hub reel on to the reel table and fix it by pulling and turning the outer knob.

(6) Set the reproduce head selector switch (Index No. 17 in Table 3-1) to the appropriate position as determined by the track format of the tape to be reproduced.

(7) If desired, connect a headset or monitor speaker/amplifier to the PHONE jack.

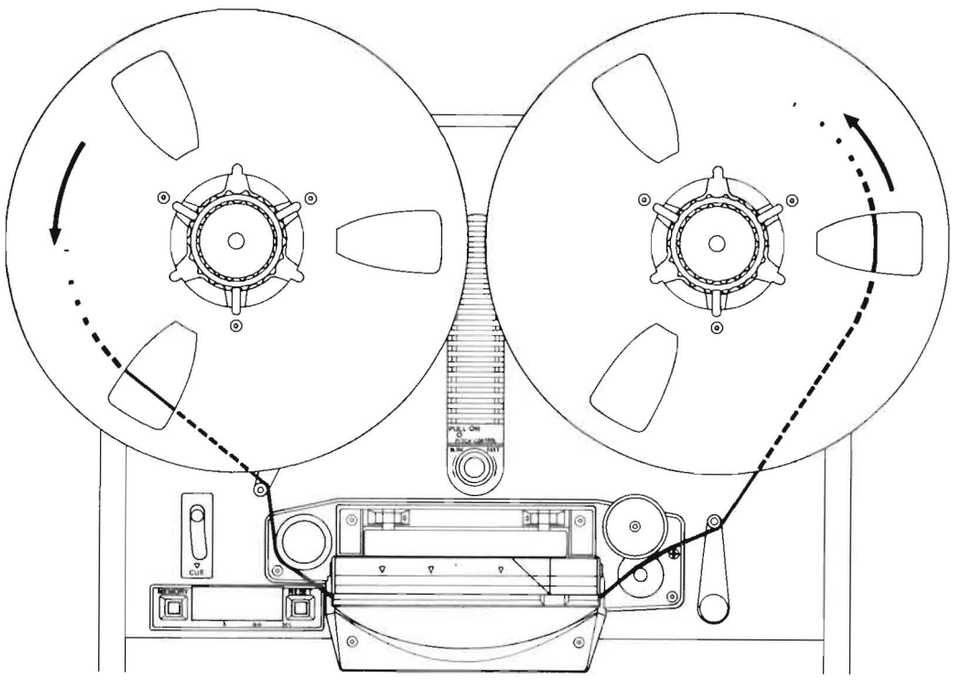


Fig. 3-2 Tape Threading

3.2.3 REPRODUCTION

To reproduce, proceed as follows:

(1) Perform all steps in the pre-operating procedure.

(2) Set the channel RECORD selector switch(es) to the "out" position.

(3) Set the reproduce head selector switch to its appropriate position.

(4) Set the channel MONITOR selector switches to their TAPE "in" positions.

(5) Press the PLAY pushbutton to begin reproducing the pre-recorded tape.

3.2.5 RECORDING WITH SELECTIVE REPRODUCTION

The selective reproduction function causes the reproduced audio to be derived from the record head rather than from the reproduce head. This permits a recording to be made on another channel synchronized (in phase) with the channel being reproduced. To record with selective reproduction, proceed as follows.

(1) Perform all steps in the pre-operating procedure.

(2) Perform all steps in the normal recording procedure for the channel to be recorded.

(3) Rewind the tape to the point where selective reproduction is to begin.

(4) Set the selective reproduction (SEL/REP) switch to the "in" position for the channel to be monitored while the recording is being made.

(5) Set the RECORD selector switch to the "in" position for the channel to be recorded.

(6) Set the MONITOR selector switch to the "in" (Tape) position for the channel being monitored.

(7) Set the MONITOR selector switch to the "out" (Source) position for the channel to be recorded.

(8) Adjust the LINE/MIC INPUT level control so that the VU meter indicates 0 for most audio peaks. (It is advisable to adjust the channel output levels so that the peak indicator lamps, located in the VU meter housings, blink occasionally.)

(9) Press the PLAY pushbutton to start tape motion. At the point where overdub is desired press the RECORD pushbutton to start recording on the selected channel(s).

(10) When recording is complete, press the STOP pushbutton to stop tape motion and deactivate the record mode, or punch-out by pressing the PLAY pushbutton.

NOTES:
1. The pitch control is used to finely adjust one track with another track(s). It can be used in both the Record and Reproduce modes.
2. The SEL. REP. mode has priority over the Record mode in this unit. (While the SEL. REP. pushbutton(s) is (are) pushed, the corresponding channel(s) can not enter the record mode.)

SECTION IV. GENERAL INFORMATION OF MAINTENANCE

4.1 TEST AND MAINTENANCE EQUIPMENT REQUIREMENTS

All maintenance, electronic, and mechanical test equipments required during maintenance, alignment, and adjustment of the recorder are listed in Table 4-1 and the standard test tapes are listed in Table 4-2.

In addition, recommended maintenance periods are shown by accumulative hours of usage and/or elapsed period of time, whichever comes first.

Equivalent equipment can be substituted for the equipment suggested in the table.

Table 4-1 Test and Maintenance Equipment

Equipment Type	Suggested Model	Used For	Period
Head cleaner	OTARI ZA-51B	Cleaning the heads and guides	8 hours
Isopropyl or denatured alcohol	Any (OTARI Cleaning Kit ZA-51B contains the above cleaning materials.)	Cleaning the tape guides, capstan, and pinch-roller	8 hours
Q tips	Any	Cleaning the heads and guides	8 hours
Head demagnetizer	Any	Demagnetizing the heads and tape guides	8 hours
Lubricating oil	OTARI Lubricating Oil PZ9E003	Lubricating the capstan of the DC servo control motor	1,000 hours or 6 months
Spring scales 500 g, 1 kg, 3 kg (0.16 oz, 0.32 oz, and 0.10 lbs)	Any (pushing and pulling)	Mechanical adjustment	1,000 hours or 6 months
Vacuum cleaner and brushes	Any	General cleaning	1 month

Table 4-2 Reproduce Alignment Test Tape

Tape Speed	Equalization	MRL *1 Catalog Number	Reference Level (Fluxivity)
15 ips	NAB	21J205	250 nWb/m*2
7-1/2 ips	NAB	21T204	250 nWb/m*2
3-3/4 ips	NAB	21F201-A	250 nWb/m*2
15 ips	IEC	21J303	320 nWb/m*3
7-1/2 ips	IEC	21T302	320 nWb/m*3

*1 Magnetic Reference Laboratory.

*2 Short circuit flux.

*3 Open circuit flux which corresponds to 290 nWb/m of short circuit flux.

SECTION V.

ROUTINE MAINTENANCE AND CONVERSION INFORMATION

5.1 ROUTINE MAINTENANCE

It is important that routine maintenance should be performed at the recommended intervals.

Exterior cleaning and demagnetization should be performed after every eight hours of operation, and the interior of the transport should be cleaned once a month.

Lubrication should be performed after 1,000 hours of operation or after 6 months, whichever comes first.

5.1.1 CLEANING

Oxide particles from the magnetic tape tend to collect on the components in the tape path and degrade the performance of the recorder. The heads and all other components in the tape path must be cleaned after every eight hours of operation, or more frequently if visual inspection indicates that cleaning is required. To clean the head assembly, proceed as follows:

1. Disconnect the power cable from the power supply.

2. Lift the head cover as illustrated in Figure 5-1.

> CAUTION
>
> WHEN CLEANING THE HEADS, USE ONLY THE RECOMMENDED SOLVENT (HEAD CLEANER) TO AVOID DAMAGING THE HEADS.
>
> KEEP THE HEAD CLEANER AWAY FROM PLASTIC FINISHES AND THE CAPSTAN PINCH ROLLER.
>
> DO NOT USE METAL TOOLS THAT CAN SCRATCH THE HEADS.

3. Clean each head stack thoroughly with a cotton-tipped applicator (Q tip) dampened with head cleaner.

4. Use isopropyl alcohol to clean all tape guiding components including the capstan shaft, and the rubber capstan pinch roller.

> CAUTION
>
> 1. DO NOT USE A HEAD CLEANER ON THE CAPSTAN PINCH ROLLER, SINCE THIS WILL CAUSE DAMAGE AND TAPE SLIP.
> 2. BEFORE REMOVING THE REAR COVER, THE PLUG MUST BE DISCONNECTED FROM THE POWER SUPPLY TO AVOID AN ELECTRIC SHOCK.

Then slowly withdraw the demagnetizer as shown in Figure 5-2.

6. Repeat step 5 for each head stack.

7. Repeat the procedure in step 5 for each guide and other metallic parts in the tape path.

8. Move the demagnetizer slowly away from the transport at least three feeds, and then disconnect the power from the demagnetizer.

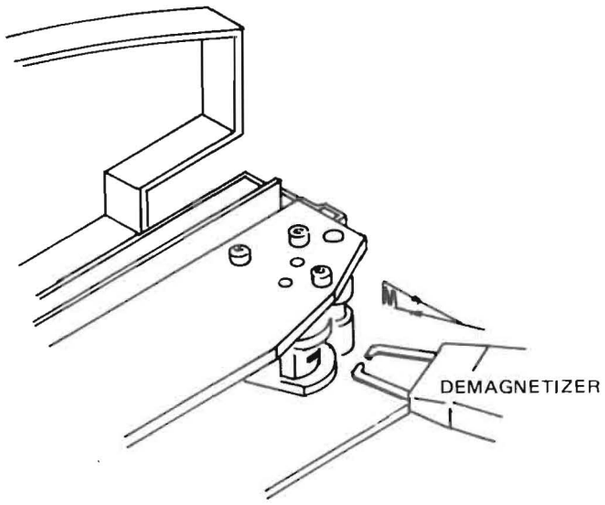


Figure 5-2
Demagnetizing

5.1.3 LUBRICATION

The only component requiring lubrication is the capstan.

Lubricate the capstan every six months, or after each 1,000 hrs. of operation (whichever occurs first), or as required using the recommended lubricating oil (Table 4-1). For lubrication, proceed as follows, referring to Fig. 5-3:

> CAUTION
>
> 1. DO NOT USE ANY OIL EXCEPT ANDEROL OTARI LUBRICATING OIL PZ9E003 FOR LUBRICATION.
> 2. BE CERTAIN TO CLEAN THE CAPSTAN SHAFT THOROUGHLY. LUBRICATING OIL COULD RUIN THE CAPSTAN PINCH ROLLER AND MAGNETIC TAPE.
> CLEAN THE CAPSTAN WITH ISOPROPYL ALCOHOL AFTER LUBRICATION.

1. Remove the pinch roller cap by turning the cross-head screw counterclockwise.

5.3 EQUALIZER CHANGE

The equalizer between the NAB or the IEC can be changed by sliding EQUALIZER selector switch on the rear panel of the amplifier unit.

However, a fine equalizer adjustment and a record level set are required.

Table 5-1 Record Level

Reference Fluxivity	Relative Level	Test Tape	Recording Tape to be used
185 nWb/m*	0 dB	Ampex Operating Level	Scotch 177 Ampex 641
250 nWb/m*	+2.6 dB	NRL NAB Standard	Scotch 206, 207, 226, 250 Ampex 406, 407, 456
320 nWb/m**	+3.8 dB	BASF or MRL IEC Standard	IEC Equalization

* Short circuit flux. ** Open circuit flux.

5.4 LINE VOLTAGE CONVERSION

The line voltage is converted by resoldering the wiring on the voltage selection terminal, proceed as follows:

1. Remove two flat head socket cap screws (marked A in Fig. 5-5) putting the ventilation channel.
   Remove four cross-recessed screws (marked B in Fig. 5-5) on the top ventilation cover (transport rear panel) from the rear of the equipment.

2. Draw out three connectors of ERASE/RECORD HEAD, REPRODUCE HEAD, TO AMP (Refer to Figure 5-5), and place the machine on its side.

3. Resolder the lead wire of the voltage selection terminal on the supply reel Ass'y to the desired voltage terminal marked as shown in Figure 5-4.

5.5 FUSE REPLACEMENT

If a fuse is blown, it is important that the possible cause is checked before replacing the fuse.

> CAUTION
>
> FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE OF FUSE.
> BEFORE REPLACING THE FUSE, REMOVE THE POWER CORD FROM THE POWER SOURCE.

Information concerning the seven fuses can be found in Table 5-2. For the main power fuse (FS1), proceed as follows:

1. Remove four screws (marked C in Fig. 5-5) holding bottom panel to the unit.

2. Open the bottom panel. Control P.C.B. assembly is located on the bottom panel.

3. Take a look at the inside of the unit, find the PUSH SWITCH P.C.B. assembly.

4. FS1, main power fuse is located on this P.C.B. assembly as illustrated in Figure 5-6.

5. All other fuses (F1 ∿ F6) are located on the Control P.C.B. assembly mentioned above, and illustrated in Figure 5-7.

6. Replace fuses as directed in Table 5-2.

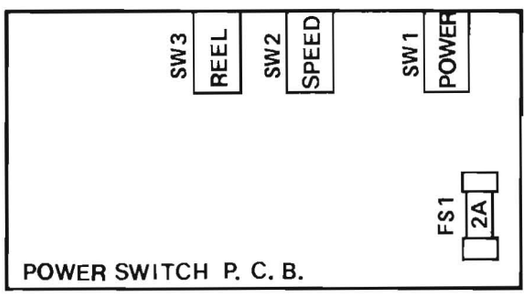


Figure 5-6 Main Power Fuse Location

5.6 SPEED CONVERSION

Normally MX-5050 MKIII-2 is factory shipped out with 7-1/2 ips and 15 ips. But MX-5050 MKIII-2 can be converted to 3-3/4 ips and 7-1/2 ips speed combination by user's modification. Followings are the information on speed conversion.

1. Refer to page 5-7 to access to control P.C.B. assembly. It is located on the bottom panel.

2. Take a look at the control P.C.B. assembly. There is black speed select switch on it.

3. Just slide the knob of the speed select switch to "L" position.

4. Then put back the bottom panel.

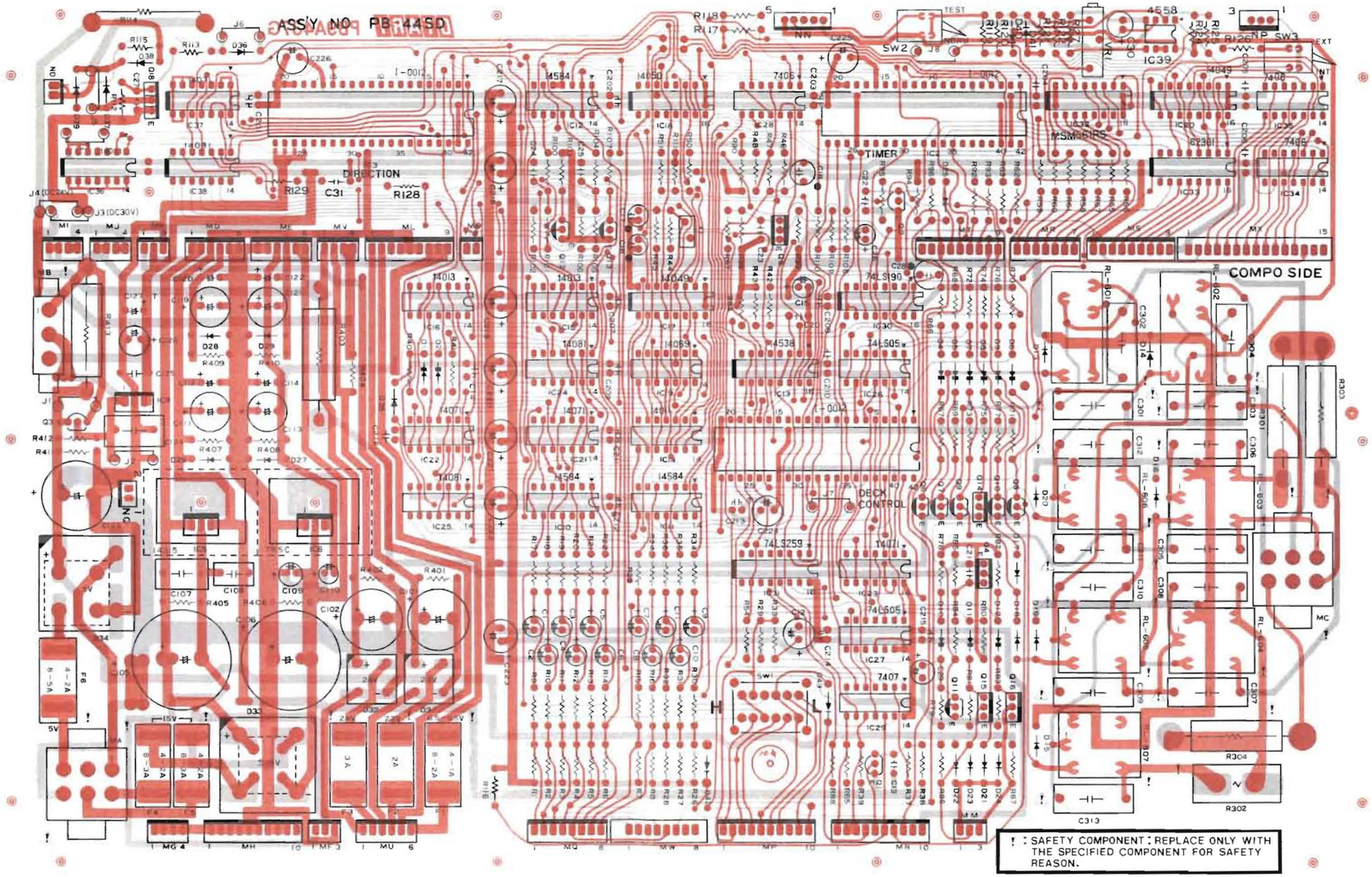
5. Adjust all pots to have optimum performance (reproduce EQ. SRL. bias record EQ. record level, and so on).

SECTION VI

P.C.B. ASSEMBLIES AND PARTS LISTS

The following P.C.B. pattern layout drawings and parts list are provided for service reference. Parts list includes only main parts or the parts difficult to obtain in the field. Also the lists include the parts which should be replaced with the exact same parts supplied by OTARI to maintain the performance. Many diodes, transistors, and ICs are well described in the schematics attached to the machine, so to find out the correct parts number of those parts you need to, refer to the schematics.

PB-44SD CONTROL P.C.B. ASSEMBLY [2]:



PB-44SD CONTROL P.C.B. ASSEMBLY [2]:

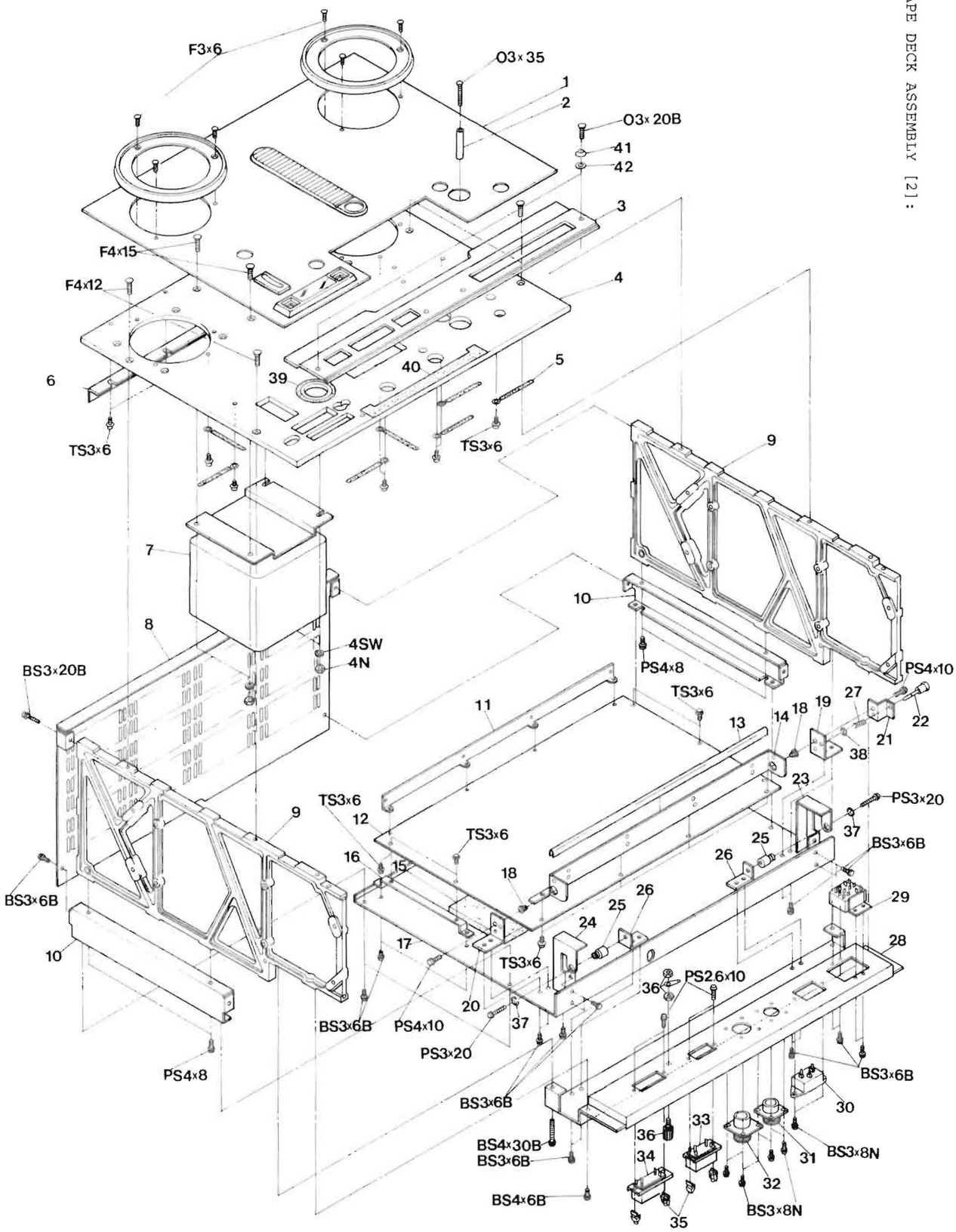
Ref. No.	Description	Parts No.	Notes
	P.C.B.	PB9A437	
	Connector	CN402213	"EI" Type 2P
	Connector	CN403043	"EI" Type 3P
	Connector	CN403075	Pin Housing 3P
	Connector	CN404044	"EI" Type 4P
	Connector	CN405045	"EI" Type 5P
	Connector	CN406046	"EI" Type 6P
	Connector	CN406077	Pin Housing 6P
	Connector	CN407047	"EI" Type 7P
	Connector	CN407048	"EI" Type 8P
	Connector	CN408227	8P Male
	Connector	CN410050	"EI" Type 10P
	Connector	CN415229	15P Male
	Spark Killer	CZ20001W	0.1 + 120Ω
	Fuse	FH7F020	2A
	Fuse	FH7F030	3A
	Fuse	FH7F050	5A
IC2, 3	IC	I-0012	
X	Crystal	PZ4C014	400kHZ
VR1	Potentiometer	RV42317 1	2kΩ
RL603 ∿ 7	Relay	RY1DC029	
RL601 ∿ 2	Relay	RY1DC040	
R413	Resistor	R8DJR33M	3W 0.33Ω
R114	Resistor	R8DJ110M	3W 11Ω
R301, 303 ∿ 4	Resistor	R8DJ180M	3W 18Ω
R403	Resistor	R8DJ5R1M	3W 5.1Ω
R302	Resistor	R93-002K	5W 100Ω
SW1	Switch	WH34008	Speed
SW2, 3	Switch	WH91045B	

SECTION VII

EXPLODED VIEW DRAWINGS AND PARTS LISTS

The followings are the exploded view drawings and parts lists. Parts list titles are followed by a key number which refers to the corresponding exploded view drawing number.

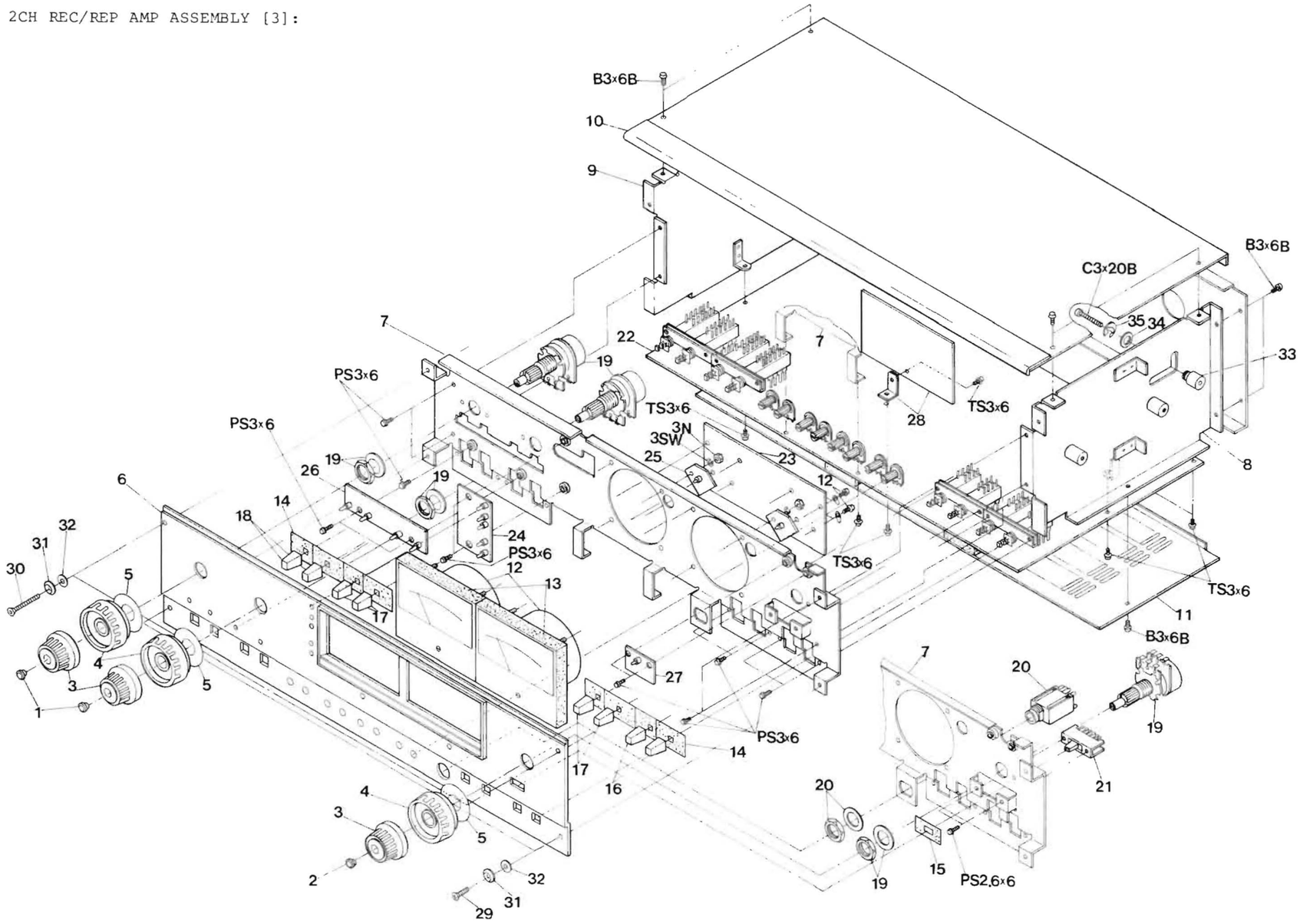
When ordering parts, give a full description, using both the part number and the name of the part. If there seems to be a discrepancy between the drawings herein and your machine, contact OTARI.


F3x6
O3x35
1
2
O3x20B
41
42
3
F4x15
F4x12
4
6
39
40
5
TS3x6
TS3x6
9
7
10
8
4SW
4N
PS4x8
PS4x10
BS3x20B
TS3x6
11
13
14
18
19
27
22
21
38
23
PS3x20
37
TS3x6
12
TS3x6
25
BS3x6B
26
16
15
18
BS3x6B
9
29
25
26
24
28
10
17
TS3x6
PS2.6x10
36
20
37
BS3x6B
PS4x10
PS3x20
BS3x6B
PS4x8
30
33
36
BS4x30B
BS3x6B
34
31
BS3x8N
32
BS4x6B
35
BS3x8N

T5068 TAPE DECK ASSEMBLY [2]:

Ref. No.	Description	Parts No.	Notes
2- 1	Panel Ass'y, Trim	T5064-A	
2	Pole, Guide	KG6E003	
3	Panel, Trim, Control	T506702	
4	Panel, Top	T506701	
5	Clamp, Code	PZ1G053	
6	Bracket, Panel Reinforce	T506604	
7	Trans, Power	TF11074	
8	Cover A, Deck	T506802	
9	Flame	T506501	
10	Bracket, Rear Panel	T506801	
11	Bracket A, P.C.B.	PB44S01	
12	P.C.B. Ass'y, Control	PB-45NA	
13	Edging	PZ1G092	
14	Angle, P.C.B.	T506809	
15	Cushion	PZ1C065	
16	Bracket, P.C.B.	T506804	
17	Cover B, Deck	T506803	
18	Rock, Bank	PZ1F016	
19	Bracket A	T506805	
20	Bracket B	T506806	
21	Bracket, Spring	T506807	
22	Stopper	T506808	
23	Arm A	T506810	
24	Arm B	T506811	
25	Shaft	T506812	
26	Angle	KZ2A089	
27	Spring	GS1094	
28	Panel, Deck Connector	T506813	
29	Connector Ass'y	CN7C-006	12P
30	Connector, Ass'y Inlet	CN603012	
31	Connector	CN105026	
32	Connector	CN110030	
33	Connector	CN225136	
34	Connector	CN234130	
35	Connector	CN7B-061	
36	Terminal, Earth	CN901040	
37	Retaining Ring, E Type	F74TE23	6 PIE
38	Retaining Ring, E Type	F74TE09	2 PIE
39	Blind	PZ1B051	
40	Blind	PZ1B052	
41	Washer, Trim	KZ6C051	
42	Washer	KZ6C011	

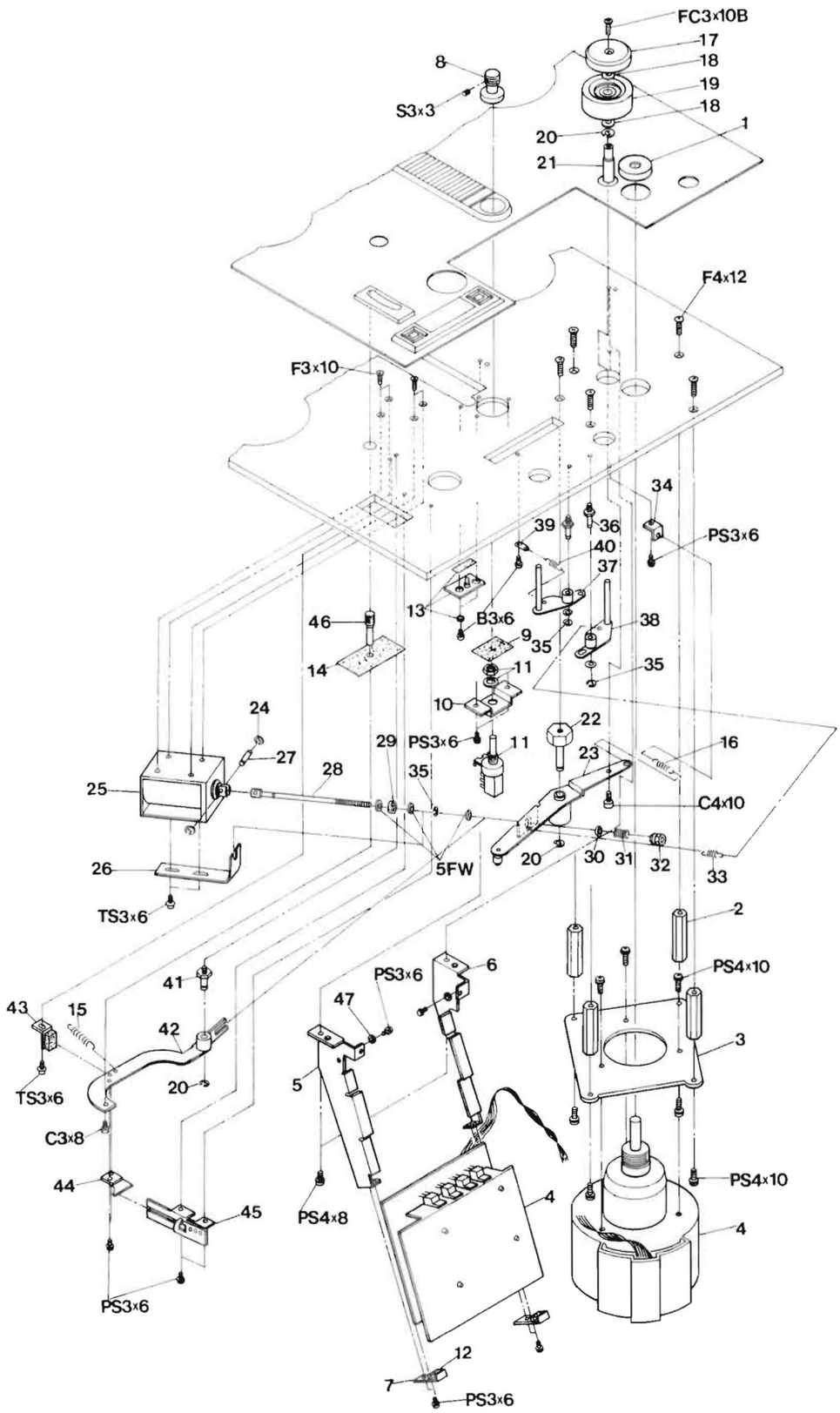
A1065 2CH REC/REP AMP ASSEMBLY [3]:



K1069 CASE ASSEMBLY [4]:

Ref. No.	Description	Parts No.	Notes
4- 1	Panel A, Side	K106901	
2	Panel B, Side	K106902	
3	Amp. Ass'y, 2ch Rec/Rep	A1065	
4	Cover, Ventilation	K106904	
5	Reel Ass'y	KW-4R	
6	Tension Arm Ass'y A	KA-4X	
7	Tension Arm Ass'y B	KA-4Y	
8	Capstan Ass'y	KC-4Y	
9	Pinch Roller Ass'y	KP-4N	
10	Head Ass'y	KH-41I	
11	Roller Ass'y, Impedance	KI-4J	
12	Timer Ass'y, Tape	SR-5K	
13	SW Ass'y Control	CB-253	
14	Cover, Upper	K105827	
15	Supporter, Front Cover	K105829	
16	Frame, Bottom	K106905	
17	Cover, Bottom	K105831	
18	Cover, Front	K105828	
19	Foot	CY4070	
20	Stud	KZ9L150A	
21	Washer	KZ6C011	
22	Washer, Trim	KZ6C051	
23	Washer	KZ6C042	
24	Washer, Trim	KZ6C028	
25	Stopper	KZ2A092	
26	Spacer	K106903	
27	Bracket	KZ3A045	

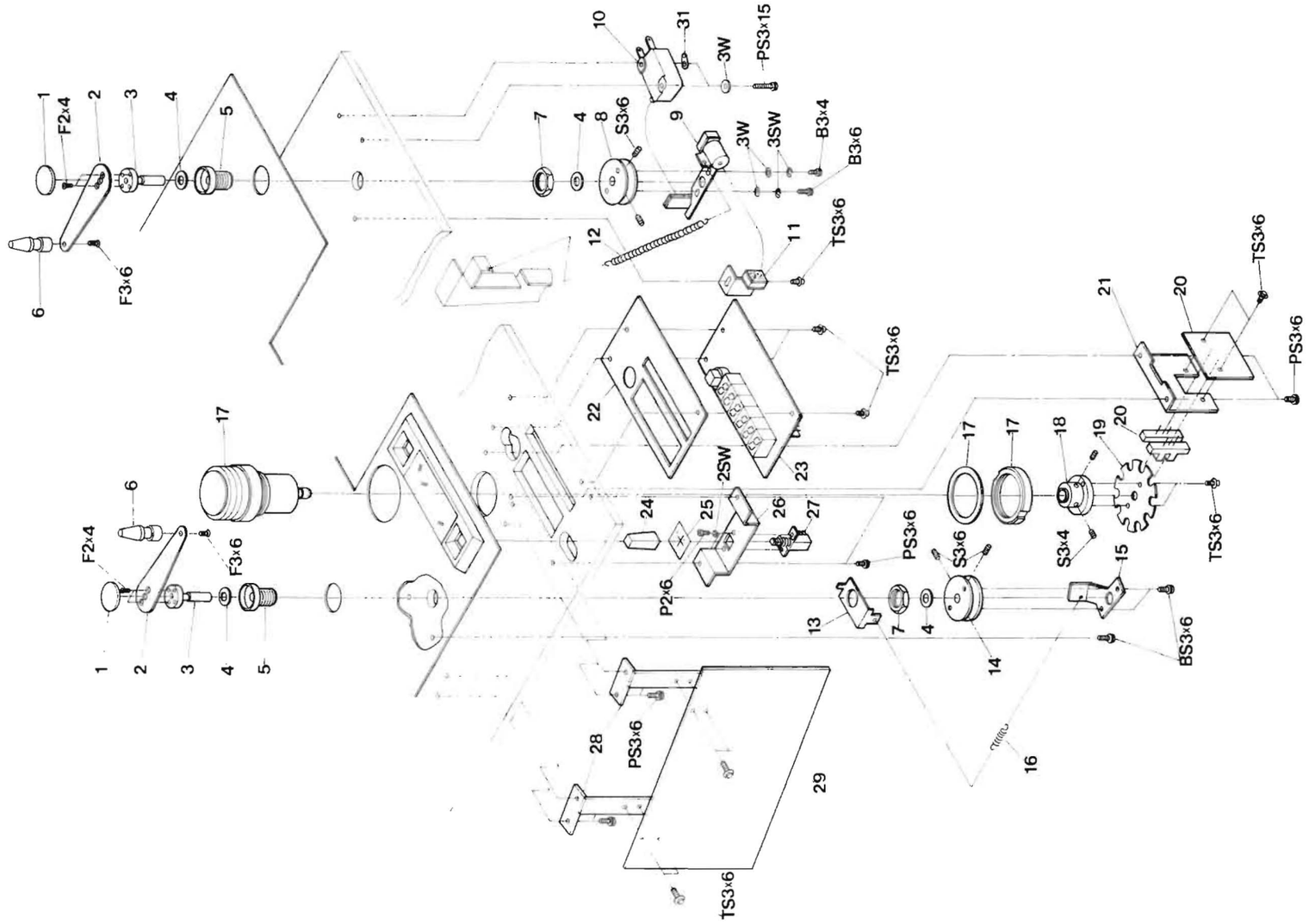
KC-4Y CAPSTAN ASSEMBLY [5]:
KP-4N PINCH ROLLER ASSEMBLY [5]:
KP-4L SHIFTER ASSEMBLY [5]:



CB-253 CONTROL SWITCH ASSEMBLY [6]:

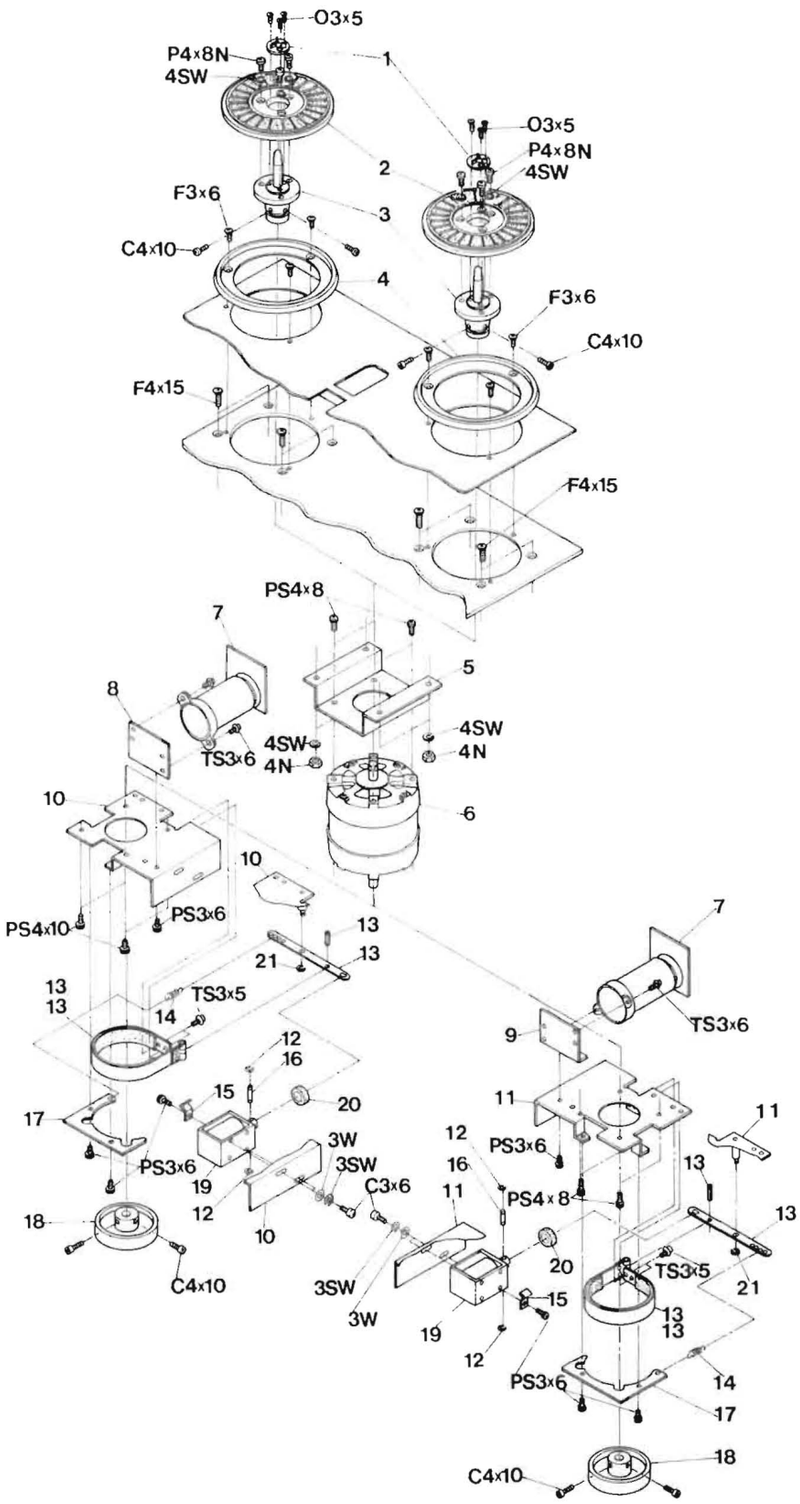
Ref. No.	Description	Parts No.	Notes
6- 1	Button A	KN2069	
2	Button B	KN2070	
3	Button C	KN2071	
4	Button D	KN2072	
5	Guide, Button	CB20602	
6	Guide, Button	CB20701	
7	Panel, Top, Control	T506705	
8	P.C.B. Ass'y, LED (B)	PB-83E	
9	Switch, Micro	WH11007	
10	P.C.B. Ass'y, Power Switch	PB-78HA	

KA-4X,4Y TENSION ARM ASSEMBLY [7]:
KI-4J IMPEDANCE ROLLER ASSEMBLY [7]:
SR-5K TAPE TIMER ASSEMBLY [7]:



KH-41I HEAD ASSEMBLY [8]:

Ref. No.	Description	Parts No.	Notes
8- 1	Housing Ass'y, Head	KH-4Y-A	
2	Stud	KH4Y009	
3	Base Plate, Head	KH0C019	
4	Bracket, P.C.B. L	KH41I01	
5	Bracket, P.C.B. R	KH41I02	
6	P.C.B. Ass'y, Head	PB-78IA	
7	Spring, Head	GS2019	
8	Spring, Head	GS2016	
9	Spring, Head	GS2015	
10	Head Ass'y, Erase 2T/2ch	GH4E082B	B2H
	Head Ass'y, Erase 4T/2ch		B4H
	Head Ass'y, Erase FT		BF
	Head Ass'y, Erase 2T/2ch		B2H-DIN
11	Head Ass'y, Repro. 4T/2ch	GH4P069C	B2H B2H-DIN
	Head Ass'y, Repro. 2T/2ch		B4H FT
12	Head Ass'y, Rec. 2T/2ch	GH4R005B	B2H B2H-DIN
	Head Ass'y, Rec. 4T/2ch		B4H
	Head Ass'y, Rec. FT		FT
13	Head Ass'y, Repro. 2T/2ch	GH4P027A	B2H B2H-DIN
	Head Ass'y, Repro. 4T/2ch		B4H
	Head Ass'y, Repro. FT		FT
14	Cover, Housing A	KH0F038	
15	Guide Ass'y, Tape	KG0D00C	
16	Housing, Head	KH0F037	
17	Connector	CN314002	
18	Bracket, Connector	KH4Y004	
19	Plate, Shield	KH4Y001A	
20	Washer, Pollyslider	F524-3	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4SW
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P4x8N
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F3x6
C4x10
F4x15
F4x15
PS4x8
7
5
8
4SW
4N
TS3x6
4SW
4N
6
10
10
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PS3x6
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C3x6
12
18
10
C4x10
3SW
3W
19
12
11
12
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PS4x8
20
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PS3x6
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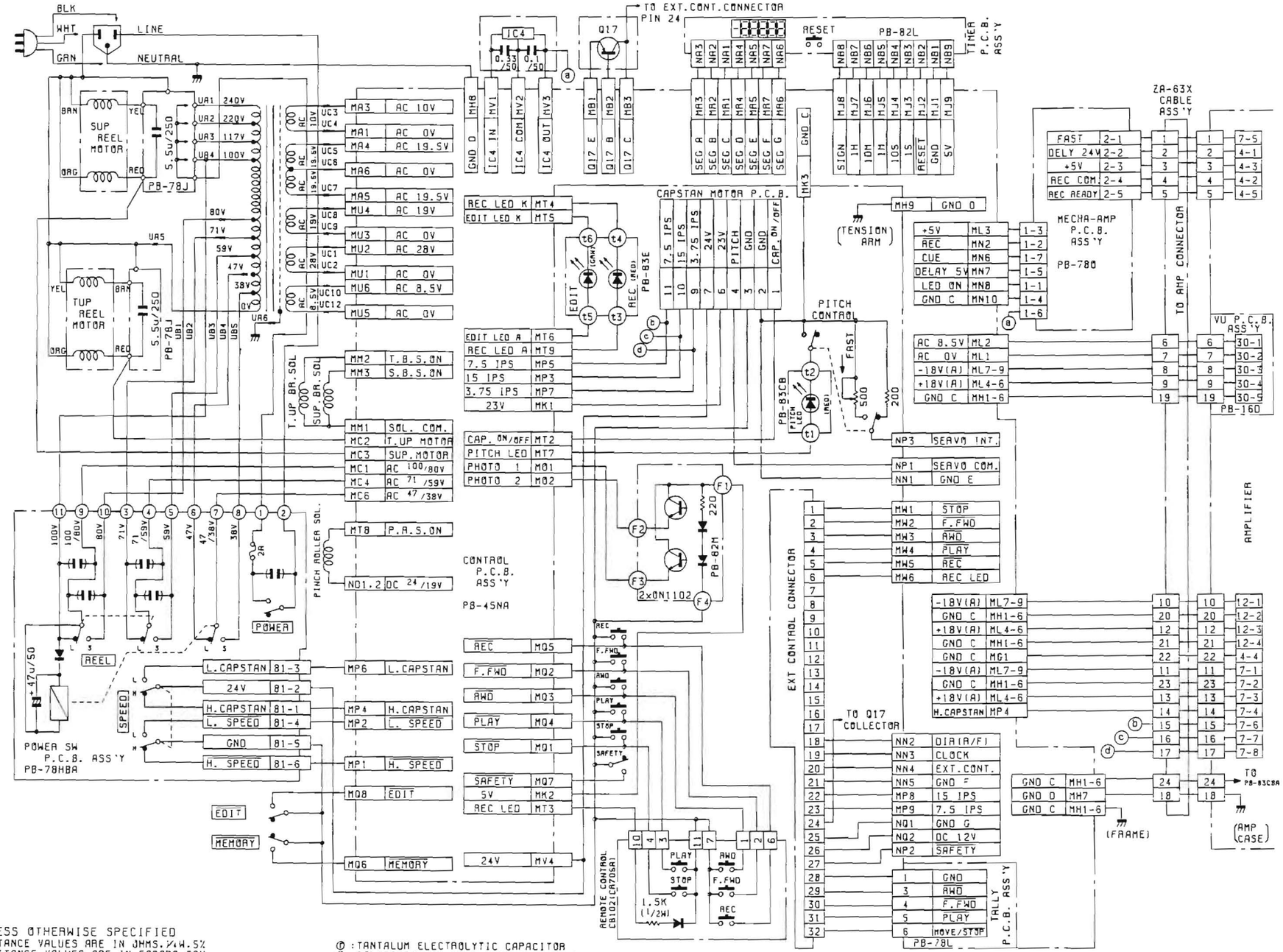
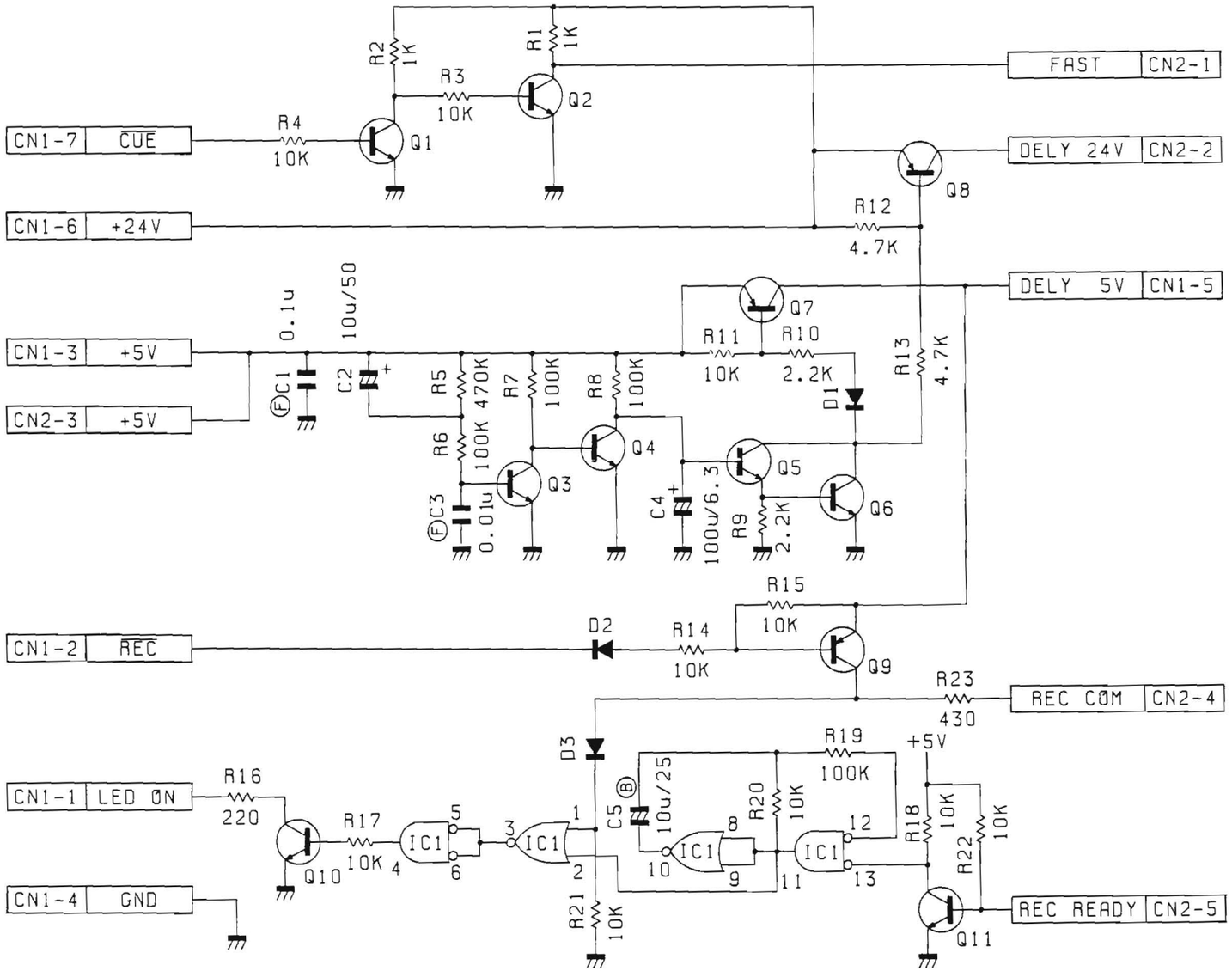


NOTES: UNLESS OTHERWISE SPECIFIED
1. RESISTANCE VALUES ARE IN OHMS. ¼W. 5%
2. CAPACITANCE VALUES ARE IN FARADS. 50V
3. CAPACITOR SYMBOL MARKS ARE AS FOLLOWS
   - ⏚ : ALUMINUM ELECTROLYTIC CAPACITOR
   - Ⓑ : BIPOLAR ALUMINUM ELECTROLYTIC CAPACITOR
   - Ⓜ : MYLAR FILM CAPACITOR (±5%. 50V)
   - Ⓢ : POLYSTYRENE FILM CAPACITOR (±5%. 50V)
   - Ⓒ : CERAMIC CAPACITOR
   - Ⓜ : MICA CAPACITOR (±5%)
   - Ⓣ : TANTALUM ELECTROLYTIC CAPACITOR
   - Ⓟ : POLYPROPYLENE FILM CAPACITOR (±5%)
   - Ⓛ : LOW LEAKAGE CURRENT ELECTROLYTIC CAPACITOR
   - Ⓜ : METALLIZED PAPER CAPACITOR (±10%)
   - ⏚⏚ : SPARK KILLER
4. ⚠ : SAFETY COMPONENT : REPLANCE ONLY WITH THE SPECIFIED COMPONENT FOR SAFETY REASON

NAME	TAPE DECK ASS'Y
PART NO.	TEAC000

DWG. NO. 3-91

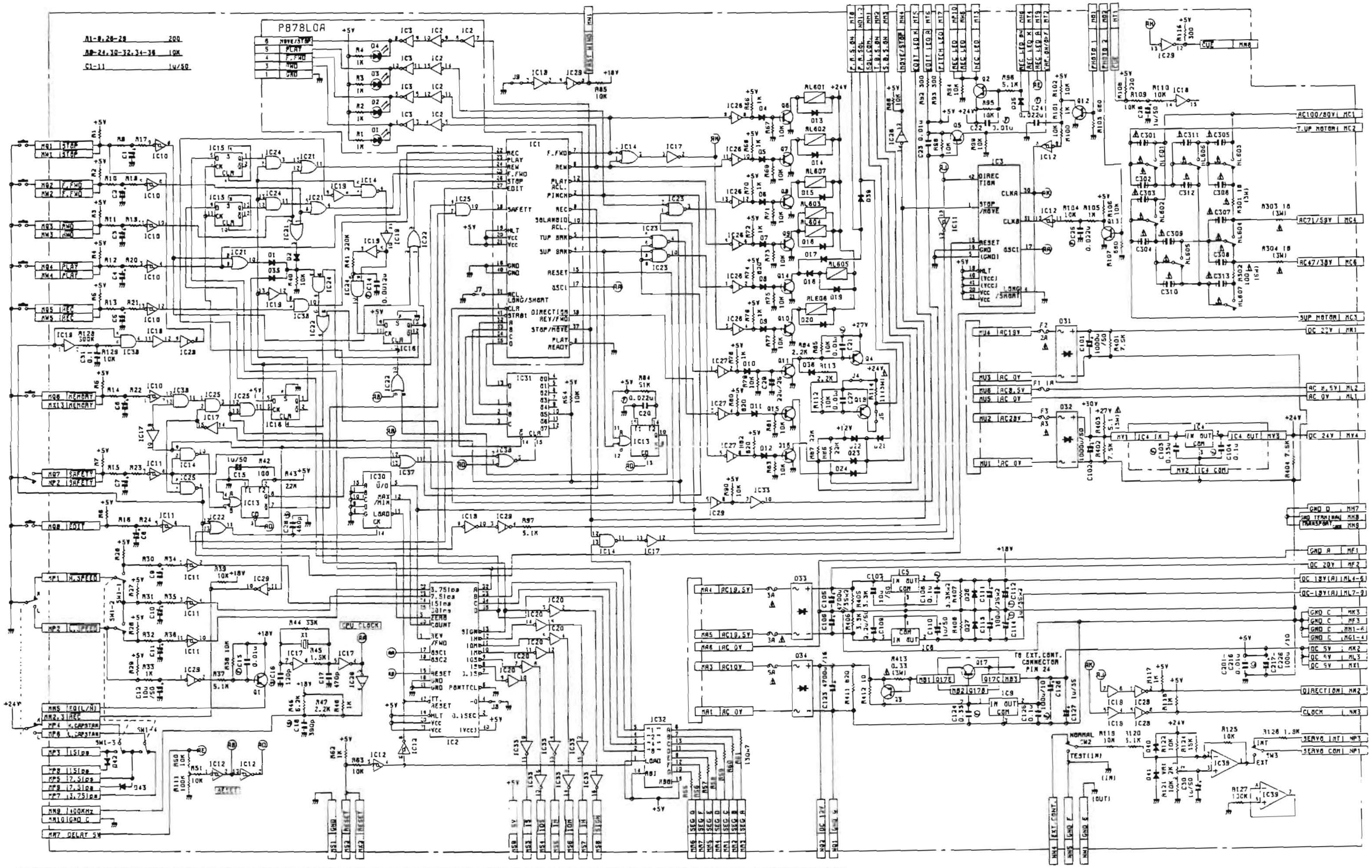


REF NO		OTARI PART NO	DESCRIPTION
Q	1-6 10.11	QC1815BL	2SC1815BL
	7.9	QA1015BL	2SA1015BL
	8	QB605K	2SB605K
IC	1	IMC14001	MC14001BCP
D	1	PNSM1-02	SM1A-02
	2.3	PN-0199	FDH9615

NOTES : UNLESS OTHERWISE SPECIFIED
1. RESISTANCE VALUES ARE IN OHMS, 1/4W, 5%
2. CAPACITANCE VALUES ARE IN FARADS 50V
3. CAPACITOR SYMBOL MARKS ARE AS FOLLOWS
- (A) : ALUMINUM ELECTROLYTIC CAPACITOR
- (B) : BIPOLAR ALUMINUM ELECTROLYTIC CAPACITOR
- (F) : MYLAR FILM CAPACITOR (±5%,50V)
- (G) : POLYSTYRENE FILM CAPACITOR (±5%,50V)
- (C) : CERAMIC CAPACITOR
- (M) : MICA CAPACITOR (±5%)
- (T) : TANTALUM ELECTROLYTIC CAPACITOR
- (P) : POLYPROPYLENE FILM CAPACITOR (±5%)
- (L) : LOW LEAKAGE CURRENT ELECTROLYTIC CAPACITOR
- (E) : METALLIZED PAPER CAPACITOR (±10%)
- : SPARK KILLER
- ⚠ : SAEFTY COMPONENT : REPLACE ONLY WITH THE SPECIFIED COMPONENT FOR SAEFTY REASON

DWG. NO. 3.84

NAME REC READY&DELY CCT P.C.B ASS'Y



REFERENCE NO.	OTARI PART NO.	DESCRIPTION	REFERENCE NO.	OTARI PART NO.	DESCRIPTION	REFERENCE NO.	OTARI PART NO.	DESCRIPTION
IC 2,3	1-0012	UNIVERSAL CONTROLLER	IC 29	1A07N	SN7407N	Q 1-12,35,36 40,41	PN151588	151588
4	IMC14324	μPC14324	30	1ALS190	SN74LS190			
5	IMC14318	μPC14318	31	1ALS259	SN74LS259			
6	IMC7918C	MC7918CT	32	1M5M561	M5M561RS	Q 1,2,3	3A1015GR	2SA1015GR
9	IMC14305	μPC14305	33	1TD62301	TD62301	4,5,18	3A1020Y	2SA1020Y
10,11,12	IMC14584	MC14584BCP	39	1MC4558C	μPC4558C	6-13	3C1885R	2SC1885R
13	IMC14538	MC14538BCP				14-16	3C2324K	2SC2324K
14	IMC14011	MC14011BCP	X 1	PZ4C014	4BR-4008 4 TYPE	17	3B816R	2SB816R
15,16	IMC14013	MC14013BCP	RL 601,602	RT1DC040	[illegible]			
17,20	IMC14049	MC14049BCP	603-607	RT1DC029	[illegible]	SW 1	4M34008	[illegible]M335
18	IMC14050	MC14050BCP	C 301-313	[illegible]2200014	[illegible]	2,3	AM910458	ULA(BLACK)
19	IMC14068	MC14068BCP						
21,22,23,27	IMC14071	MC14071BCP	D 13-23,38,39	[illegible]	[illegible]	[illegible]	PZ4E001	QUICK START TIMER
24,25,28	IMC14081	MC14081BCP	31,32	[illegible]	[illegible]	[illegible]		TIMER [illegible]
26,37	1ALS05N	SN74LS05N	33,34	[illegible]	[illegible]			
28,34,35	[illegible]	SN74[illegible]				[illegible]11	1Y423171	[illegible]JC094P232

	REFERENCE NO.	OTARI PART NO.	DESCRIPTION
PB78LOA	IC 1	1-0012	UNIVERSAL CONTROLLER
	2	1MC14049	MC14049BCP
	3	1A06N	SN7406N
	D 1-4	PNTLR124	LED

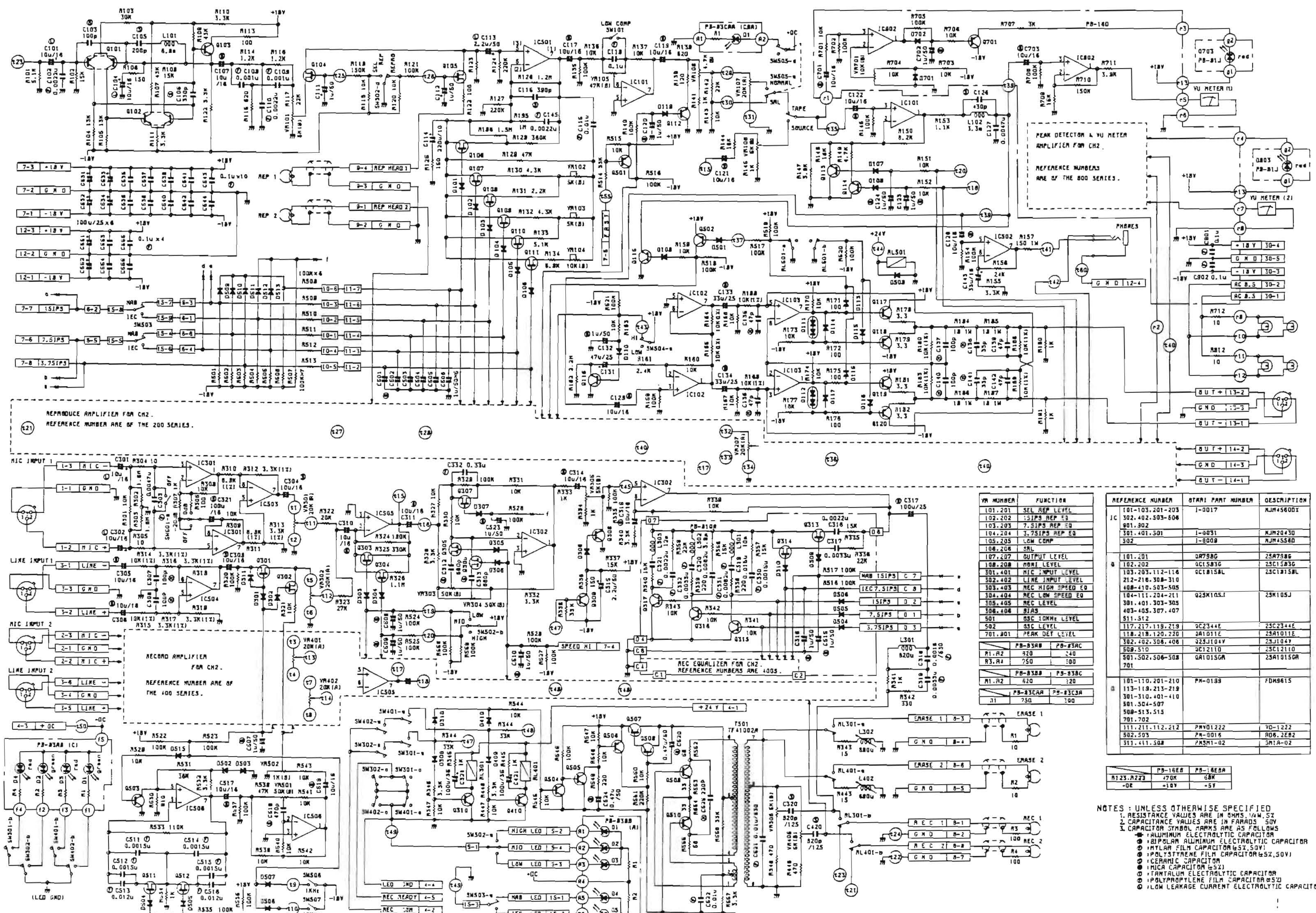
NOTES: ▭ SHOWS THE CIRCUIT ON THE CONTROL P.C.BOARD.

NOTES: UNLESS OTHERWISE SPECIFIED
1. RESISTANCE VALUES ARE IN OHMS, 1/4W, 5%
2. CAPACITANCE VALUES ARE IN FARADS, 50V
3. CAPACITOR SYMBOL MARKS ARE AS FOLLOWS
- ALUMINUM ELECTROLYTIC CAPACITOR
- BIPOLAR ALUMINUM ELECTROLYTIC CAPACITOR
- MYLAR FILM CAPACITOR(±5%, 50V)
- POLYSTYRENE FILM CAPACITOR(±5%, 50V)
- CERAMIC CAPACITOR
- MICA CAPACITOR(±5%)
- TANTALUM ELECTROLYTIC CAPACITOR
- POLYPROPYLENE FILM CAPACITOR(±5%)
- LOW LEAKAGE CURRENT ELECTROLYTIC CAPACITOR
- METALLIZED PAPER CAPACITOR(±10%)
- SPARK KILLER

4. ▲: SAFETY COMPONENT. REPLACE ONLY WITH THE SPECIFIED COMPONENT FOR SAFETY REASON

NAME CONTROL PCB ASS'Y

DWG. NO. 3 . 9



VR NUMBER	FUNCTION
101.201	SEL REP LEVEL
102.202	1SIPS REP EQ
103.203	7.5IPS REP EQ
104.204	3.75IPS REP EQ
105.205	LOW COMP
106.206	SAL
107.207	OUTPUT LEVEL
108.208	MONI LEVEL
301.401	MIC INPUT LEVEL
302.402	LINE INPUT LEVEL
303.403	REC HIGH SPEED EQ
304.404	REC LOW SPEED EQ
305.405	REC LEVEL
306.406	BIAS
501	OSC 10KHz LEVEL
502	OSC LEVEL
701.801	PEAK DET LEVEL

	PB-83AB	PB-83AC
R1.R2	320	240
R3.R4	750	300

	PB-83BB	PB-83BC
R1.R2	620	220

	PB-83CAA	PB-83CBA
R1	750	390

	REFERENCE NUMBER	OTARI PART NUMBER	DESCRIPTION
IC	101-103.201-203 302.402.503-508 801.802	I-0017	NJM4560DX
	301.401.501	I-0031	NJM2043D
	502	I-0008	NJM4556D
Q	101.201	QA798G	2SA798G
	102.202	QC1583G	2SC1583G
	103.203.112-116 212-216.308-310 408-410.503-505	QC1815BL	2SC1815BL
	104-111.204-211 301.401.303-305 403-405.307.407 511.512	Q2SK105J	2SK105J
	117.217.119.219	QC2344E	2SC2344E
	118.218.120.220	QA1011E	2SA1011E
	302.402.306.406	Q2SJ104Y	2SJ104Y
	509.510	QC1211D	2SC1211D
	501.502.506-508 701	QA1015GR	2SA1015GR
D	101-110.201-210 113-119.213-219 301-310.401-410 501.504-507 508-513.515 701.702	PN-0199	FDH9615
	111.211.112.212	PNVD1222	VD-1222
	502.503	PN-0016	RD6.2EB2
	311.411.508	PNSM1-02	SM1A-02

	PB-16EB	PB-16EBA
R123.R223	470K	68K
-DC	+18V	+5V

NOTES : UNLESS OTHERWISE SPECIFIED
1. RESISTANCE VALUES ARE IN OHMS. 1/4W. 5%
2. CAPACITANCE VALUES ARE IN FARADS 50V
3. CAPACITOR SYMBOL MARKS ARE AS FOLLOWS
- : ALUMINUM ELECTROLYTIC CAPACITOR
- : BIPOLAR ALUMINUM ELECTROLYTIC CAPACITOR
- : MYLAR FILM CAPACITOR (±5%, 50V)
- : POLYSTYRENE FILM CAPACITOR (±5%, 50V)
- : CERAMIC CAPACITOR
- : MICA CAPACITOR (±5%)
- : TANTALUM ELECTROLYTIC CAPACITOR
- : POLYPROPYLENE FILM CAPACITOR (±5%)
- : LOW LEAKAGE CURRENT ELECTROLYTIC CAPACITOR

NAME	REC. & REPRO AMP. P.C.B. ASS'Y
PART NO.	[illegible]

DWG. NO. 3..8[illegible]

MX5050 MK-III 2 TAPE RECORDER

SCHEMATIC DIAGRAMS TYPE E

OTARI PART #	DESCRIPTION	DWG. #
A10620B	REC/REP AMP. ASS'Y	3-8097
PB44S0C	CONTROL P.C.B. ASS'Y	3-9055
PB7800A	REC.DELAY CONTROL P.C.B. ASS'Y	3-8495
T50680B	WIRING DIAGRAM	3-9054